SPECIFICATION

Please replace paragraph [0007] beginning on page 2, lines 17-23 through page 3, lines 1-5 of the specification as filed with the following:

[0007] Although processes exist for forming organometallic polymers containing the elements of silicon, boron, carbon, nitrogen, and hydrogen, the disclosed processes require multi-step, complex, and expensive processing for obtaining a homogeneous polymer having SiBCN components. Moreover, the resulting products tend to be impure. For example, polyborosilazane via the monomer route and polymer route shown in FIG. 1(a) is disclosed by Riedel et al. ("A Silicoboron Carbonitride Ceramic Stable to 2000 C", Nature, vol. 382, 29, August 1996). Additional steps (not shown) beyond those shown in FIG. 1(a) are necessary in order to produce a crosslinked polymer structure. Moreover, either of the routes shown results in the polyborosilazane product being impure. Specifically, the polyborosilazane produced in the Riedel process undergoes hydrolysis during synthesis. Moreover, the synthesis does not efficiently eliminate reaction byproducts such as ammonium chloride, which leads to significant chlorine content mixed with the polyborosilazane in the form of ammonium chloride crystals.

Please replace paragraph [0010] beginning on page 4, lines 16-24 through page 5, lines 1-6 of the specification as filed with the following:

[0010] The method can further comprise the step of partially pyrolyzing the SiBCN preceramic polymer or oligomer at a temperature of at least 300 °C in an inert atmosphere. The step of partially pyrolyzing the SiBCN preceramic polymer or oligomer is preferably performed at a

temperature of between 400 and 600 °C. Partially pyrolyzing a preceramic polymer or oligomer is believed to be an independently novel concept described herein as others have previously only fully pyrolyzed preceramic polymers to form ceramics. The partially pyrolyzed preceramic polymer or oligomer formed includes at least 3 wt % hydrogen, and preferably ~~at least~~ at least 4 wt %, and also provides hydrothermal stability. Although preceramic polymers generally include at least 3 wt % hydrogen, preceramic polymers are known to lack hydrothermal stability. Although ceramics provide hydrothermal stability, ceramics lack measurable hydrogen content. For nuclear applications, significant hydrogen content (e.g. at least 4 wt %) is necessary to absorb and slow down neutrons, while hydrothermal stability is required for the application conditions. Thus, partially pyrolyzed preceramic polymer or oligomers according to the invention provide both of these requirements for nuclear applications.

Please replace paragraph **[0015]** beginning on page 5, lines 5-8 of the specification as filed with the following:

[0015] Figure 1(a) ~~and (b)~~ shows a prior art polyborosilazane synthesis via a monomer and a polymer route ~~and a new synthetic route for SiBCN based preceramic polymers and products, respectively~~.

Please add the following new paragraphs **[0016]** and **[0017]** after paragraph **[0015]**:

[0016] Figure 1(b) shows steps including intermediate products believed to be formed in a new synthetic route for SiBCN based preceramic polymers and products, according to an embodiment of the invention.

[0017] Figure 1(b) shows steps including intermediate products believed to be formed in a new synthetic route for SiBCN based preceramic polymers and products, according to an embodiment of the invention. Although believed to be accurate, the accuracy of intermediate products shown in Fig. 1(b) are not required to practice the invention, nor do Applicants seek to be bound to the same. In contrast to the reaction shown in Fig. 1(a), hexamethyldisilazane as a reactant at this time attacks the chlorine atom remaining intermediate structure (a) again. Consequently, (b) is formed as a product in the stable form. Since the boron hydride at the left side of Intermediate (a) can be more easily attacked by Lewis base adducts than the silicon at the right side of Intermediate (a), the additional reaction of the left compound is preferable. Therefore, the reaction between the molecules of Intermediate (a) may be possible to form Intermediate (c). With this reaction, the chlorine atom attached to the boron molecule is substituted. However, the chlorine atom at the silicon atom still remains. The chlorine atom attached to the silicon may be attacked by HMDZ so as to form Intermediate (d). The intermediate molecules (d) can be linked to the formation of boron-nitrogen bonds eliminating the end groups in the molecules by condensation. In consequence of this reaction, the product (e) is obtained at the end.